ITEM 114 FY94
04DS1
9 September 1992

PURCHASE DESCRIPTION

FREQUENCY SYNTHESIZER (1 kHz to 140 MHz)

FSNFU-B

1.0 GENERAL This procurement requires a stable RF synthesizer capable of generating signals over the frequency range of 1 kHz to 140 MHz with internal and external modulation capabilities.

2.0 CLASSIFICATION The equipment shall meet the requirements of MIL-T-28800( ), Type III, Class 5, Style E, Color R for Navy shipboard, submarine, and shore applications with the following modifications and exceptions:

a. The Electromagnetic Interference requirements of MIL-T-28800( ) are limited to CE01, CE03, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (back panel search excluded), RE02 (14 kHz to 10 GHz), and RS03.

b. The warm-up time is extended to one hour.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics

3.1.1 Frequency Range: At least 1 kHz to 140 MHz

3.1.2 Frequency Resolution: At least 1 Hz

3.1.3 Frequency Accuracy: At least $\pm 1 \times 10^{-5}$ after a one hour warm-up or equal to external reference

3.1.4 Spectral Purity (equal to or better than the limits specified below)

3.1.4.1 Harmonics: -30 dBc
3.1.4.2 Nonharmonics: -65 dBc
3.1.4.3 Phase Noise: Less than -120 dBc/Hz measured 20 kHz from the carrier

3.2 Output Characteristics

3.2.1 Power Output Range: At least +19 to -127 dBm for CW and FM operation and at least +13 to -127 dBm for AM operation

3.2.2 Output Level Resolution: At least 1 dB over the entire output range

3.2.3 Power Output Accuracy: At least ± 1.5 dB from +19 to -40 dBm with an additional ± 0.1 dB/step for levels below -40 dBm

3.2.4 Impedance/Connector: 50 ohms; type BNC female connector

3.2.4.1 VSWR: Better than 1.5:1 for output levels less than 0 dBm

3.3 Modulation Characteristics

3.3.1 Amplitude Modulation (AM)

3.3.1.1 Internal

3.3.1.1.1 Rates: At least 400 Hz and 1 kHz
3.3.1.1.2 Depth: At least 1 to 90% modulation with less than 3% distortion

3.3.1.2 External

3.3.1.2.1 Rates: Variable from 20 Hz to 15 kHz minimum

3.3.1.2.2 Depth: At least 1 to 90% modulation with less than 3% distortion

3.3.2 Frequency Modulation (FM)

3.3.2.1 Internal

3.3.2.1.1 Rates: At least 400 Hz and 1 kHz
3.3.2.1.2 FM Deviation: 0 Hz to at least 1% of the carrier for frequencies below 20 MHz; 0 Hz to at least 199 kHz for carrier frequencies above 20 MHz

3.3.2.2 External

3.3.2.2.1 Rates: Variable from 20 Hz to 20 kHz minimum
3.3.2.2.2 FM Deviation: 0 Hz to at least 1% of the carrier for frequencies below 20 MHz; 0 Hz to at least 199 kHz for carrier frequencies above 20 MHz

4.0 GENERAL REQUIREMENTS

4.1 Power: 115/230 Vac ±10%, 50/60 Hz, 120 VA maximum

4.2 Lithium Batteries: Per MIL-T-28800, lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Dimensions: The total volume of the unit shall not exceed 71,235 cm^3 (4347 in^3).

4.4 Weight: The total weight of the unit shall not exceed 23 kg (50 lb).

4.5 Calibration Interval: After calibration, the equipment shall meet each performance requirement within the tolerance specified for a period of at least 12 months.

4.6 Remote Programming: The generator shall be capable of being remotely controlled via the IEEE-488 interface bus, operating as both a talker and listener, having at least the following subset of bus functions: AH1, L4, SH1, T6, SR1, DC1 and RL1.